

H2.3 Temperate high-mountain siliceous scree

Summary

This habitat consists of siliceous, mostly acidic screes, moraines or stone rivers found at high altitudes and cool sites in mountain ranges through the nemoral zone of Europe. The screes are colonised by a range of mostly perennial, mostly acidophilous plants, the composition strongly influenced by altitude and regional climate and often including many relic and local endemic species, though less than on calcareous screes. Often the vegetation cover is sparse but these screes can be more humid because of the impervious and water-retentive character of the substrates and long snow-lie also encourages luxuriant growth and accumulation of humus. Tourist activity and infrastructure pose threats and the habitat needs to remain undisturbed.

Synthesis

Despite a variable level of data quality among countries, and the lack of quantitative data, this habitat is assessed as Least Concern since it is widespread in Europe and the reductions in quantity (1-2%) and quality (slight decline (30% severity) affecting 5% of the extent of the habitat) over the past 50 years have been small and localized.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Sub-habitat types that may require further examination

No sub-habitats have been distinguished for further analysis.

Habitat Type

Code and name

H2.3 Temperate high-mountain siliceous scree



Alpine siliceous screes from the *Androsacion alpinae* alliance, together with grasslands and cliffs, Belledonne, France (Photo: Alexis Mikolajczak).



A high-mountain siliceous scree with coarse elements on Kademia Peak in the Central Balkan National Park, Bulgaria (Photo: Rossen Tzonev).

Habitat description

This habitat consists of siliceous, mostly acidic screes, moraines or stone rivers of high altitudes (mainly over 1000 m above sea level) and cool sites in mountain ranges of the nemoral zone of Europe, including

the Alps, Pyrenees, Carpathians, central and eastern parts of Balkan Peninsula, Apennines, etc.. Scree habitats consist of rock fragments with different forms and sizes covering the frost-shattered summits of mountains or accumulating on slopes below siliceous cliffs. Siliceous scree habitats are made up of siliceous rocks, such as quartzite, granite and sandstones.

The scree habitats are colonised by a range of mostly perennial plant species. The vegetation consists of assemblages of mostly acidophilous or neutrophilous species. The composition is strongly influenced by altitude and geographical ranges. Siliceous scree habitats are habitats which contain many relic and local endemic species, but less than calcareous scree habitats. The diversity of vegetation units is also smaller compared to calcareous scree habitats. A widespread alliance in the Alpine and Carpathian mountain systems is the *Androsacion alpinae*. In the Pyrenees, where the habitat is more common, two specific alliances occur: *Senecionion leucophylli* and *Dryopteridion oreadis*. The plants grow tufted between the scree stones, in places with a little soil. Typical species include *Androsace alpina*, *A. wulfeiana*, *Saxifraga bryoides*, *Silene acaulis* and *Festuca picta*. Another widespread species of this habitat in most European mountains is *Oxyria digyna*.

The siliceous scree habitats are more humid than the calcareous ones, because they have larger water-retention characteristics. The humid, humus-rich siliceous scree habitats of the Alps, on slopes long-covered with snow, are carpeted by *Luzula alpinopilosa*, and accompanied by species that constitute an ecological variant of the snow patch communities. There are also communities of ferns and low semi-shrubs, including *Gymnocarpium dryopteris*, *Cryptogramma crispa*, *Athyrium distentifolium*, *Dryopteris dilatata*, *Cystopteris fragilis*, *Vaccinium* spp. colonizing non-stabilized scree habitats on shady places, often with a high proportion of large blocks. The scree vegetation in the Caucasus Mountains., outside the range of the EU 28+, is represented by the endemic alliances *Scrophulario minimae-Symphylomion graveolens* and *Chaerophyllion humilis*. Those scree habitats are outside this habitat type's definition.

Indicators of quality:

- Occurrence of natural erosion processes.
- Presence of rare, relict or endemic species.
- Absence of human activities, including grazing.
- Absence of alien species.

Characteristic species:

Vascular plants: *Adenostyles leucophylla*, *Achillea erba-rotta*, *A. nana*, *Androsace alpina*, *A. hedraeantha*, *Athyrium distentifolium*, *Arenaria biflora*, *Armeria alpina*, *Cardamine glauca*, *C. resedifolia*, *Cerastium pedunculatum*, *C. pyrenaicum*, *C. uniflorum*, *Cochlearia tatrae*, *Cryptogramma crispa*, *Deschampsia alpina*, *Doronicum clusii*, *D. grandiflorum*, *Dryopteris dilatata*, *D. expansa*, *D. oreades*, *Festuca picta*, *Gentiana frigida*, *Geum reptans*, *Gymnocarpium dryopteris*, *Lerchenfeldia flexuosa*, *Linaria alpina*, *Luzula alpinopilosa*, *Minuartia sedoides*, *Murbeckiella pinnatifida*, *Oreochloa disticha*, *Oxyria digyna*, *Pleuropteropyrum undulatum*, *Poa contracta*, *P. laxa*, *Polygonum alpinum*, *Ranunculus glacialis*, *Saxifraga adscendens*, *S. androcasea*, *S. bryoides*, *S. carpathica*, *S. cernua*, *S. oppositifolia*, *S. pedemontana* subsp. *cymosa*, *Senecio glaberrimus*, *S. leucophyllus*, *S. transylvanicus*, *S. rochelianus*, *S. rupestris*, *Silene acaulis*, *Poa cenisia*, *Vaccinium* spp., *Veronica baumgartenii*.

Mosses: *Dicranoweisia crispula*, *Polytrichum alpinum*, *Racomitrium lanuginosum*, *Sanionia uncinata*

Lichens: *Polyblastia alpina*, *Solorina crucea*

Reptiles: *Podarcis muralis*

Birds: *Alectoris graeca*, *Tichodroma muraria*, *Prunella collaris*, *Monticola saxatilis* Mammals: *Chionomys*

nivalis

Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS:

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EuroVegChecklist:

Androsacion alpinae Br.-Bl. in Br.-Bl. et Jenny 1926

Senecionion leucophylli Br.-Bl. 1948

Dryopteridion oreadis Rivas-Mart. 1977 corr. Rivas-Mart. et al. 1984

Annex 1:

8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

Emerald:

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MAES-2:

Sparsely vegetated land

IUCN:

6. Rocky Areas [e.g. inland cliffs, mountain peaks]

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?

Yes

Regions

Alpine

Justification

This habitat type occurs mostly within the high mountains of Europe because the underlying conditions (functioning) are found best at high elevations (frost-shattered cliffs). Moraines represent also a major part of this habitat types in alpine and nival levels.

Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Austria</i>	Present	957 Km ²	Stable	Stable
<i>Bulgaria</i>	Present	288 Km ²	Decreasing	Stable
<i>France</i>	Corsica: Present France mainland: Present	500 Km ²	Stable	Stable
<i>Italy</i>	Italy mainland: Present Sardinia: Present Sicily: Present	2,187 Km ²	Stable	Stable
<i>Poland</i>	Present	1 Km ²	Stable	Stable
<i>Romania</i>	Present	291 Km ²	Decreasing	Unknown

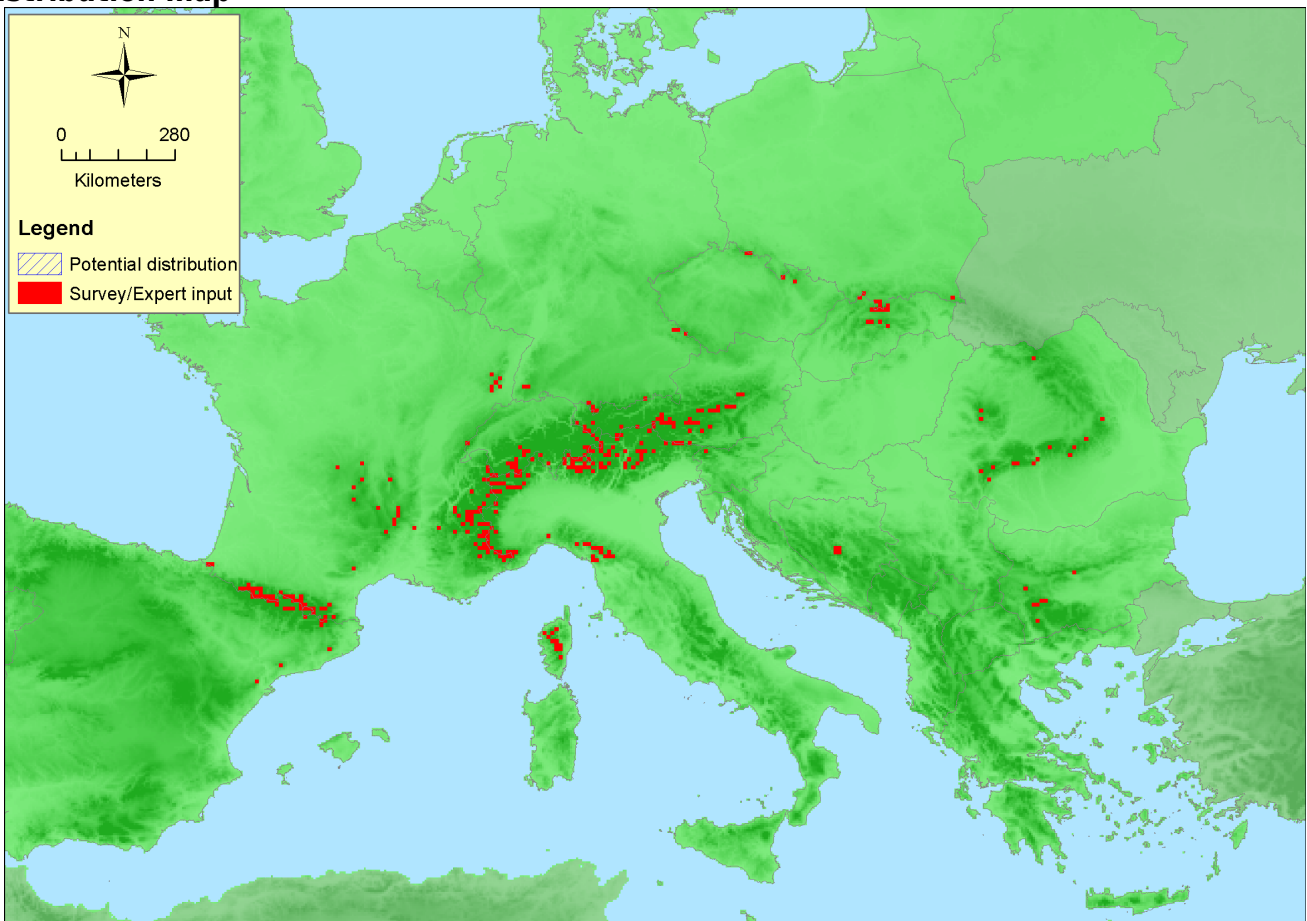
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Slovakia</i>	Present	16 Km ²	Decreasing	Unknown
<i>Slovenia</i>	Uncertain	Km ²	-	-
<i>Spain</i>	Spain mainland: Present	247 Km ²	Stable	Stable

EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Bosnia and Herzegovina</i>	Present	1 Km ²	Stable	Stable
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	Unknown Km ²	Unknown	Unknown
<i>Switzerland</i>	Present	850 Km ²	Stable	Stable

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
<i>EU 28</i>	1580500 Km ²	325	4,488 Km ²	
<i>EU 28+</i>	1580500 Km ²	342	5,339 Km ²	

Distribution map



The map is complete for EU, but very incomplete for Switzerland and the Balkan. Data sources: EVA, Art17, NAT.

How much of the current distribution of the habitat type lies within the EU 28?

Of the current distribution of the habitat, 85% lies within the EU 28, if one considers that this habitat's native biota is limited to European phytosociological alliances. Alliances from the Caucasus mountains are formed by different biota.

Trends in quantity

The current trend in quantity is stable at the European scale because this habitat is found in mountainous regions, and it is therefore weakly affected by human activities. The trend over the last 50 years is almost stable (1 % decline). This very slight reduction reflects local destruction of the habitat by the development of ski complexes, construction of roads, and quarrying. The reduction caused by the natural process of scree stabilization (i.e. favouring the establishment of grasses and shrubs) may have played a role over the historical period (250 years) but there is no data available to estimate precise values. The future trend is expected to be stable or slightly decreasing. Despite weak differences among countries, the decrease in quantity appears to be higher in Western Europe than in Eastern Europe.

- Average current trend in quantity (extent)

EU 28: Stable

EU 28+: Stable

- Does the habitat type have a small natural range following regression?

No

Justification

This habitat type is widespread across high-mountain regions.

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

No

Justification

This habitat type occupies large areas across high-mountain regions of Europe.

Trends in quality

The reduction in quality over the last 50 years has occurred quite locally with a slight decline (30% severity) affecting 5% of the extent of the habitat.. The reduction in quality is largely due to the loss of functionality of screes as a result of nearby works. When crossing screes, roads and ski runs reduce the mobility of scree materials (stones) by cutting their slow downward flow. Erosion and alteration of cliffs above screes - by regularly releasing materials - are also needed for good scree functioning. Securing works of such cliffs (wire nets placed on or below cliffs) are very likely to prevent screes from functioning normally. Historical trend might have followed the same evolution but not enough data is available to estimate precise values. Future trends in quality will continue to decrease locally because of infrastructure development. Climate change and higher temperatures will probably influence quality in the future but little is known about the outcomes at the European scale.

- Average current trend in quality

EU 28: Stable

EU 28+: Stable

Pressures and threats

The main source of threats to this habitat type in Western Europe is infrastructure construction in the mountain environment (high altitudes): ski complexes with ski runs, tracks and roads. Of particular concern is the reshaping of ski runs, which consists of leveling the terrain surface by grinding stones so as to make it as smooth as possible ('boulevard' ski runs). At lower altitudes quarrying is also a threat. Stabilization of screes also occurs naturally when erosion of cliffs above stops, but this natural process is hard to quantify. Among future possible threats is climate change.

List of pressures and threats

Mining, extraction of materials and energy production

Mining and quarrying

Transportation and service corridors

Roads, paths and railroads

Human intrusions and disturbances

Skiing complex

Natural System modifications

Reduction, lack or prevention of erosion

Climate change

Changes in abiotic conditions

Temperature changes (e.g. rise of temperature & extremes)

Conservation and management

Screes are important natural features of the mountain environment. Therefore, this habitat type has no specific management requirements except leaving it undisturbed and undestroyed. Conservation is then effective when free evolution is possible, like within protected areas. 'Manage landscape features' refers to the need to better protect this kind of habitats with a high degree of naturalness in land-use planning, especially when no specific regulation can be applied (no protected species or habitat, outside a protected area, outside a Natura 2000 site).

List of conservation and management needs

Measures related to spatial planning

Legal protection of habitats and species

Manage landscape features

Conservation status

8110 : ALP FV, ATL U1, CONT U1

When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

The habitat has some capacity to recover naturally, but it is dependent on some geomorphological processes which are very slow (erosion). As far as we know, there is no experiment of restoration of screes.

Effort required

200+ years
Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-1.1 %	Unknown %	Unknown %	Unknown %
EU 28+	-1.3 %	Unknown %	Unknown %	Unknown %

There has been a very slight reduction in quantity at the EU 28 and EU 28+ levels in the past 50 years. Calculations were made with territorial data only. There is no available quantitative data on historical or future reductions in quantity and this habitat is therefore assessed as Least Concern under Criterion A.

Criterion B: Restricted geographic distribution

Criterion B	B1			B2				B3	
	EOO	a	b	c	AOO	a	b		c
EU 28	>50,000 Km ²	No	No	> 10	>50	No	No	> 10	> 10
EU 28+	> 50,000 Km ²	No	No	> 10	>50	No	No		

The habitat is widespread, its EOO is larger than 50,000 Km² and the AOO is larger than 50. Since the major threat to this habitat is infrastructure construction, it is estimated to occur at well more than ten locations. This habitat is therefore assessed as Least Concern under Criterion B.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	5 %	32 %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	5 %	31 %	Unknown %	Unknown %	Unknown %	Unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	Unknown %	Unknown %	Unknown %	Unknown %	Unknown %	Unknown %
EU 28+	Unknown %	Unknown %	Unknown %	Unknown %	Unknown %	Unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	Unknown %	Unknown%	Unknown %	Unknown%	Unknown %	Unknown%
EU 28+	Unknown %	Unknown%	Unknown %	Unknown%	Unknown %	Unknown%

There has been a reduction in quality with a slight decline (approximately 30% severity) affecting 5% of the extent of the habitat in the last 50 years. The values reported above were calculated using only territorial data. There is no information on historical or future trends in quality and this habitat. This habitat is therefore assessed as Least Concern under Criterion C/D.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	Unknown
EU 28+	Unknown

There is no quantitative analysis available that estimates the probability of collapse of this habitat type

and it is therefore assessed as Data Deficient under Criterion E.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	LC	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	LC	DD	DD	DD	LC	LC	LC	LC	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Least Concern	-	Least Concern	-

Confidence in the assessment

Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors

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References

Valachovič M., Dierssen K., Dimopoulos P., Hadač E., Loidi J., Mucina L., Rossi G., Valle Tendero F. and Tomaselli M. 1997. The vegetation on screes - survey of higher syntaxa in Europe. *Folia Geobotanica et Phytotaxonomica* 32: 173-192.